Part I – Identification
Company: Ball Metal Beverage Container Corp.
Product/Service: Aluminum Beverage Containers
Facility Location: 27402 72nd Avenue South, Kent, WA 98032-7366
Mailing Address: 27402 72nd Avenue South, Kent, WA 98032-7366
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Name: Doug Barndt, Senior Environmental Engineer
Telelphone: 303-460-5381
Address: 9300 West 108th Circle, Broomfield, CO 80021-3682
Have you applied for this award before? Yes, in 2001 and 2002
We are a Commercial Enterprise
The Kent plant has 115 employees

Part 2 – Overview
1. Briefly describe your business or organization.

Ball Metal Beverage Container Corp. in Kent (Ball) manufactures aluminum beverage cans for the beer and beverage industry. Lightweight, fully recyclable, quickly chilled and easy to store, the aluminum beverage container is the package of choice in homes, vending machines, and coolers. The facility has two can manufacturing lines. Cans are made by using a cupping press to stamp aluminum cups, using bodymakers to form the cups into 12 ounce cans, washing the cans using corrosive materials, basecoating some cans (i.e. coating the can exterior with a white coating), decorating the exterior of the cans with ink and varnish, coating the interior of the cans for corrosion and flavor protection and palletizing the cans for shipment. More information about the manufacturing process and Ball Corporation can be found at www.ball.com.

2. Have you received any environmental awards during the last five years?

2002 – Finalist for the Governor's P2 Award;
2000, 2001 Silver Award and 2002, 2003, and 2004 Gold Award for Commitment-to-Compliance from the King County Industrial Waste Program;
2004 EnvirOvation Award, King County Industrial Waste Program.

3. Have you had any environmental violations during the last five years?

The plant had limited pH exceedances in self-monitoring of wastewater during 2000 and 2001.

Part 3 – Your Efforts
4. How much have you reduced your consumption of materials?

The following consumption of materials has been reduced.

Aluminum -- Can spoilage has been reduced by about 40% in the last 6 years, resulting in approximately 510,000 pounds of aluminum per year manufactured into product rather than waste for recycling. (Explained further in question # 10)
Water – Water use in the can washing process has been reduced by about 30%, resulting in a reduction of >5,000,000 gallons per year. (Explained further in question # 7)
Inside Spray Coating – Inside spray coating has been reduced by 20% in the last 8 years, saving about 40,000 gallons of coating per year. (Explained further in question # 10)
Cupper and Bodymaking Lubricants – Cupper and Bodymaking lubricant usage has been reduced by >50% in the last 8 years, saving over 8,000 gallons per year. A new cupper lubricating system was installed in 2001 that improved the application and eliminated leaks. A new bodymaker lube filtration system was installed in 2000 to improve the life of the coolant. In addition, the plant has changed lubricants toward those with higher performance and longer life.
Hydraulic Oil – Hydraulic oil usage has been reduced by 45% per year since 2000, or over 18,000 gallons per year. (Explained further in question #10)
Lime and Sulfuric Acid – Sulfuric acid is used in the can washing process and also for wastewater treatment to remove oil from water. Lime is used to raise the wastewater pH. Due to using less water in the can washers, better pH control, and less wastewater loading, use of both materials has been reduced significantly. In 2003, lime usage for wastewater treatment was 294,000 pounds vs. 123,550 pounds in 2004, a 35% normalized reduction. In 2003, sulfuric acid use was 12,100 gallons versus 5,005 gallons in 2004, a 36% normalized reduction.
Product Packaging – Wood and chipboard packaging has been eliminated. (Explained further in question #5)

5. How much ahve you changed to materials that are more sustainable?

The plant has always used aluminum for can production, which is 100% recyclable indefinitely. The following are some facts about the benefits of the aluminum can. Using recycled aluminum requires 95% less energy and creates 97% less water pollution than producing can sheet material from virgin bauxite ore. In 2002, 53 billion cans were recycled in the USA, saving the energy equivalent of 15 million barrels of crude oil – the country's entire gasoline consumption for one day. It takes as little as 60 days to turn empty cans in the recycling bin into new cans on retailers shelves. More facts on the sustainability of the aluminum can are available at www.cancentral.com.

Over the years the plant has transitioned cleaning materials for tooling, inkers, and parts, from MEK, to isopropyl alcohol (IPA) (e.g. 13,042 pounds of waste IPA generated in 1991), to less toxic water based cleaners. No flammable waste for cleaning has been generated since 2002. Over several years Ball has worked with coating vendors (ink, inside spray, basecoat, and overvarnish) to reduce the content of federally-regulated hazardous air pollutants (HAPs) and volatile organic compounds (VOCs). For instance, inks contain about 20% less VOC and HAPs compared to 8 years ago.

Lastly, starting in 2000, the plant changed completely from wood pallets/top frames and chipboard slip sheets to plastic packaging. The plant uses over 20,000 plastic pallets,

15,000 plastic top frames, and 500,000 separator sheets to deliver product to customers. On average, the plastic packaging lifespan is 7-10 years versus 1-3 years for wood/chipboard packaging. Spent plastic separator sheets are sold to a recycling company for reuse. Broken top frames and pallets are shipped back to the suppliers where they are shredded and the plastic resin is reused for new products.

6. How much recycled material do you buy?

Aluminum used in production contains about 85% recycled aluminum. During 2004, the plant manufactured over 1 billion cans from 30,000,000 pounds of aluminum, meaning about 25,000,000 pounds of aluminum was from recycling, rather than virgin ore. Plastic strapping used to package finished beverage cans on pallets contains 35% recycled plastic. In 2002 the administrative office furniture original to the facility was recycled and replaced with newer used furniture.

7. How much have you reduced your consumption of fresh water?

A major water conservation project was implemented in March 2004, reducing water/wastewater about 30% normalized or >5,000,000 gallons per year. Specifically, washers for cleaning aluminum cans require six stages of cleaning, four of which are water-rinsing stages. Previously, fresh water was added to each stage and discharged as wastewater. Weirs were constructed with overflow's connecting the preceding stage to capture and utilize the same water. Fresh water is now added to only stage five and cascaded back by gravity to stage four and then to stage three with the weir overflow process, essentially better utilizing the water for more cleaning.

The plant used to test the fire water pump system weekly for one hour, resulting in about 1,000 gallons of clean water being discharged. After talking with our insurance company in 2004, the test duration was reduced 50%, saving about 26,000 gallons of water and 170 gallons of diesel fuel (for the pump) per year. Also, the pump cooling water used to be discharged as wastewater, but was re-plumped in 2004 to return the cooling water to the fire water holding tank, saving about 120,000 gallons per year.

In 2003 a moisture sensor was installed to manage the lawn irrigation based on need rather than a routine schedule. The irrigation system has a sensor so when a rain event exceeds $1/8^{th}$ of an inch the turf sprinklers do not engage, saving water.

8. How much have you reduced your consumption of energy?

Manufacturing changes were made during the last two years to the can forming process and can conveying that reduced energy consumption. Changing the can necking process reduced the plant air requirement, allowing one reciprocating air compressor to be turned off and save electricity. Improving the can conveyance (from air conveying to mass conveying) reduced five motors. Within the last six years, the plant has also had three re-lamping projects to improve lighting efficiency. There have also been reductions in natural gas usage. Can oven temperatures were lowered to eliminate unnecessary extra

coating curing. Also, the comfort heating temperature in the building and especially the warehouse was reduced to conserve energy.

In 2002 a trash compactor was purchased to replace the open roll-off system, which reduced the number of landfill tipping trips. Similarly in 2002, an emphasis was made to fill our wastewater sludge accumulation container, rather than transporting partially full loads on a routine pickup schedule. Both efforts reduced disposal trips by about 50%, saving over 1,300 truck miles per year.

Lastly, the facility roof was replaced in 2003 which doubled the insulting R factor from R9 to R18. Hourly employees work a shift rotation requiring an average of 3.5 trips per week, reducing transportation impacts.

9. How much have your changed your energy use from non-renewable to renewable sources?

To date the plant has not purposely changed energy use from non-renewable to renewable sources. However, Ball Corporation, which includes the Kent plant, is a charter member of EPA's Climate Leaders Program, a voluntary program to inventory, target, and reduce greenhouse gas (GHG) emissions. Ball Corporation's goal is to reduce GHGs primarily through energy efficiency programs and possibly move toward more renewable energy sources. More information about this commitment is available at www.epa.gov/climateleaders/partners/index.html.

10. How much have you reduced or eliminated waste and emissions?

For several years the plant has had a focus on waste reduction. Our EMS Goals and Objectives table for the past 6 years (see attached for the maximum allowable pages) identifies many of the efforts and successes. For example, wastewater lime sludge disposal has been reduced by 40% (319 tons vs. 201 tons) and used oil has been reduced by 65% (79, 410 gallons vs. 29,743 gallons) from 1998 compared to 2004, normalized for production. Sludge has been reduced by improving operational control of washer water and wastewater treatment, and using less water. Used oil has been reduced by monitoring, repairing, and preventing equipment leaks, and improving the removal of water contaminating used oil. The greatest virgin oil use is hydraulic oil. The hydraulic oil in each bodymaker is metered and recorded each weekday to identify abnormally high consumption, so leaks can be identified and corrected. The average monthly hydraulic oil use was 3,371 gallons in 2001, reduced to 1,789 gallon through April 2005.

The plant recycles the following wastestreams: all metals (aluminum, various grades of steel, etc.); plastic wrap, wood, and cores from the aluminum coils; beverage containers from the lunchroom; office paper; plastic packaging; and cardboard.

In 2001 the plant started focusing on eliminating exposure of stormwater to industrial operations. The plant removed and/or covered equipment, waste accumulation bins, and other industrial-related operations outside to prevent storm water pollution.

A mist collection system was installed in 2001 to collect oil mist resulting from the can bodymakers. The system improved the interior air quality and reduced oily aerosol emissions. In 2004 the trim ring cyclone used to convey wet aluminum scrap was removed and the conveyance was connected to the main scrap cyclone, and equipped with a control system to remove soluble oil from the scrap. The project eliminated oily mist emissions and helped remove soluble oil from the scrap, to be reused in the bodymaking process.

The plant has reduced air emissions. For example, in 1998 about 368 pounds of VOC were emitted for every million cans produced compared to 287 pounds in 2004, a 22% decrease normalized for production. The plant continues to use and move toward coatings with lower VOCs and better performance. In addition, in 2002 a more robust statistical process control (SPC) system was implemented (and refined continuously) to measure and reduce manufacturing specifications to improve efficiencies. System upgrades, implementing new technology, and attention to details have helped measure and control the application of overvarnish and inside spray coatings, improving manufacturing efficiencies. For example, the application specification for inside spray (the highest VOC containing coating) has been reduced by about 20% during the past 8 years.

Upgrades to the plant SPC program, equipment changes (e.g. can conveyance changes, new neckers, etc.), operational controls (e.g. better use of lubricants, tooling management, etc.), and attention to detail have been instrumental in improving manufacturing efficiency and quality. During the past six years, plant spoilage has been reduced by 40%, meaning that during 2004, approximately 510,000 pounds of aluminum was made into quality cans rather than cans that were scraped for recycling.

11. Is your product or service environmentally superior to others?

Our product is superior to any other packaging, as outlined in the first paragraph answer to question #5. Aluminum cans are 100% recyclable indefinitely, save energy, reduce water pollution, wastes, etc. The aluminum beverage can returns to the retailers shelf as a new, filled can in an as few as 60 days after collection, a leader of the closed loop life cycle. As another benefit, almost 1 billion dollars were earned by community groups recycling cans during 2004 in the USA.

12. What have you done to reduce negative effects upon biodiversity from the manufacturing or use of your products or services?

Using aluminum with 85% recycled content reduces the need to mine, transport, and refine virgin ore. Ball is actively involved by supporting trade group (Can Manufacturing Institute, and Aluminum Can Council) initiatives to encourage recycling. Besides ongoing recycling of aluminum cans used by plant employees, the Kent can plant participated in the 2003 and 2004 America Recycles Day Aluminum Can Challenge, being a leader by example. The Washington state specific recycling rate of aluminum beverage cans is unknown (51.6% was the 2004 national rate), however, page 103 of a

WDOE report (www.ecy.wa.gov/pubs/0407018.pdf) indicates that 17,608 tons of aluminum was recycled in the state during 2003.

13. What have been the economic benefits of your efforts, to your company and your community? What have been the costs?

The plant has realized several million dollars of cost savings resulting from pollution prevention initiatives and increased manufacturing efficiencies achieved since 1998. Many of the benefits have been a result of investment in new plant equipment, employee training, improved systems, and implementation of a performance-based environmental management system (EMS). In short, the plant continues to progress in making a higher quality beverage can with fewer materials and environmental impacts. Since 1998 waste disposal costs have been reduced by >50%, environmental fees have been reduced >30% and waste disposal liability has been reduced.

14. What have been the benefits to your employees or volunteers of your efforts?

Efforts implemented over the years and culture change have resulted in a safer and cleaner work environment for employees, and less environmental impacts on the surrounding community. The plant safety record has improved in part due to improved housekeeping, improved lighting, and less hazardous materials. Plant indoor air quality is also cleaner. The wastewater efficiency improvement project was a good example of management and hourly employees working together to improve the operation, resulting in a sense of pride and accomplishment. The accomplishments over the years have been in part a result of culture change. Employees are much more aware of environmental impacts and their ability and responsibility to manage and reduce impacts. This has been accomplished through company commitment, employee interest and willingness to change, improved training and communication, and implementation of a performance-based EMS.

15. What have you done to support your local community? To support our global community?

The Kent plant has participated in the following activities in the last 5 years to support the local community.
United Way - yearly
Coat and Jacket drives - Kent Food Bank
Food drives - Kent Food Bank
Toys for Joy - Kent Fire Department
Race for the Cure - American Cancer Society
Ice Cream Social & Octoberfest lunches- American Cancer Society
Jingle Bell Run - Arthritis Foundation
Used eyeglasses - Lions Club International
Used clothing drives - Kent Food Bank
Used cell phones - DAWN (Domestic abuse women's network)
Baskets (toiletries & personal items) for woman/children- DAWN

America Recycles Day Aluminum Can Challenge
Drop everything and read (Starlake Elementary school)

16. How were your efforts innovative from what is commonly practiced in your field?

Our water conservation project, already described, was innovative.

17. What environmental leadership have you shown?

In 2003 Ball requested to participate in the WDOE TREE program, to share our successes and also to learn from the TREE team. The TREE team conducted site visits in 2004 and published a waste reduction assessment report. The plant is moving toward implementing suggestions from the TREE report. For example, the TREE report identified a potential vendor to recycle the plastic ink buckets. Ball visited the vendor and in 2005 shipped about 600 pounds of plastic buckets for recycling. This application identifies many aspects of environmental leadership, from reduction of raw materials and wastes, operational innovations to better use resources, and a long term systematic commitment to reduce environmental impacts. Many of the plant successes, problem solutions, and best practices are shared with other Ball manufacturing plants.

18. Do you follow environmentally-preferable purchasing guidelines?

Since 1998 there has been a system to review all new materials before they can be received into the plant, to be evaluated by the corporate EHS department for potential health and safety, and environmental impacts. The system was automated in 2001 to an intranet-based system. Sometimes materials are denied use due to potential environmental impacts or health/safety concerns, and/or opportunities to use more friendly materials.

19. If you sell a product, what happens to it after its use?

Aluminum beverage containers are recycled. The plastic packaging (pallet, top frames, and slipsheets) are returned for reuse (7-10 year life span). The plastic strapping is sometimes recycled by the customer.